

RESTRICTED
SECURITY INFORMATION
AIRCRAFT ACCIDENT REPORT

ORIGINAL

PAGE 1 OF 4 PAGES
REPORT NUMBER: 100-10000000000000000000000000000000

THE AIRCRAFT ACCIDENT BOARD SHALL SUBMIT THIS REPORT TO THE C.O. OF THE ACTIVITY CONDUCTING THE INVESTIGATION. IT SHALL THEN BE FORWARDED BY THE C.O. IN ACCORDANCE WITH CURRENT AIR INSTRUCTIONS.

1. DATE OF ACCIDENT	09100	2. ACTIVITY SUBMITTING REPORT	3. AIR FORCE ACT.
18 DEC 1952	Fighter Squadron 831	7-52	
4. MODEL A/C: F9F-5	5. REPORTING ACTIVITY OF A/C: Fighter Squadron 831		
6. NAME OF UNIT OPERATING THIS AC:	NAS, Moffett Field	7. OPERATIONAL STATUS OF A/C:	2. COMPAIRALAMEDA
Fighter Squadron 831	1. COMCARIRGRU 15	3. COMAIRPAC	
8. LOCATION OF ACCIDENT:	Five miles NW LIVERMORE, California	9. UNIT TO WHICH OPERATOR ATTACHED:	Fighter Squadron 831
10. PERSONNEL INVOLVED (including name and rating code of those served, but deceased or sick)			
A. FULL NAME, RANK, SERVICE, FILE NO. (List portion in lateral first)		B. GUNN	C. POSITION
DANIELSON, Darrell Frederick Allen, Jr. Lieutenant, (b) 1315, USNR		29	EJECTION Seat

11. PILOT EXPERIENCE	TOTAL ALL MODELS	TOTAL THIS MODEL	LAST 12 MONTHS ALL MODELS	LAST 3 MONTHS ALL MODELS	LAST 3 MONTHS THIS MODEL	INSTRUMENT RATE Standard
TOTAL HOURS	869.0	79.5	239.1	83.5	79.3	AIR FORCE
INSTRUMENT HOURS			37.2	7.9	5.6	
NIGHT HOURS			9.8	9.8	8.3	DATE 10/1952
CV LANDINGS	15	0	0	0	0	11-1-44

12. CAUSE OF INCIDENT TO FLIGHT	NOT INCIDENT TO FLIGHT	13. PURPOSE OF FLIGHT	14. TIME IN FLIGHT
<input checked="" type="checkbox"/>		Division Tactics	LA6 1,0

15. AIRCRAFT UNKNOWN BROKEN	16. ALTITUDE 5-10 mi	17. DARKNESS T	18. CLEARANCE ISSUED VFR local
<input checked="" type="checkbox"/>		<input type="checkbox"/>	
19. WEATHER UNKNOWN	20. ANGLE OF IMPACT 15°	21. SPEED ON IMPACT over 500 kts	22. MAXIMUM FOLLOW IMPACT
<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/> 10

23. AIRCRAFT AND ENGINE DATA (Put in all data in every case of material failure or malfunction; actual or suspected)					
HISTORY OF OVERHAULS	MONTHS IN THIS PERIOD	FAT HOURS SINCE OVERHAUL	FAT HOURS SINCE ACCEPTANCE	TYPE OF CHECK LIST PERFORMED	FAT HOURS SINCE CHECK
AIRCRAFT: 1	0	3	0	MAJOR	7.2 7
ENGINE: 1			0	MAJOR	7.2 7
ENGINE: 2					
ENGINE: 3					
ENGINE: 4					

24. HAS THIS A/C BEEN DAMAGED IN PREVIOUS ACCIDENT(S) DURING PRESENT SERVICE TOUR? YES NO

25. UNINTENTIONAL AC/DSO (Check if will be made to return "P" factor, all others secondary "S")
 1. PILOT (OR CREW) ERROR 2. MATERIAL FAILURE OR MALFUNCTION 3. UNKNOWN

26. OTHER CONDITIONS INVOLVED IN THIS ACCIDENT (Leave blank)

1. KNOCK, STALLING, SLIPSTREAM, TURBULENCE 2. PITCHING OR ROLLING DECK 3. COMMUNICATION DIFFICULTY 4. AIRPORT OBSTACLES 5. FOUR SEAS 6. TERRAIN OBSTACLES

27. ENGINES POSITIONED IMMEDIATE FORWARD 1. PNEUMATIC LIMITING 2. ENGINE FAILURE 3. TAIL EXHAUSTION OR REAR EXHAUSTION

28. PERSONAL SAFETY EQUIPMENT USED 1. PARACHUTI 2. EJECTION SEAT 3. HARNESS 4. SAFETY BELT 5. EXPOSURE SUIT 6. PROTECTIVE SUIT 7. OXYGEN SYSTEM 8. FIELD #8-52

29. ENCLOSURES AND DISTRIBUTION CHECK OFF LIST

1. PILOT	2. WITNESSES	3. DRAWINGS	4. WEATHER REPORT	5. LOADING/HARVEST	6. SAFETY BELT	7. RELEASE	8. MANUFACTURER	9. OTHERS	10. APPROVALS	11. COMMENTS
<input checked="" type="checkbox"/>										
DRG: CDR (OF-500) VIA CHM. OF COMO.										
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DATE SUBMITTED TO CDR: 22 December 1952

29. The Accident

On the morning of December 10, 1952, LT. D. F. DANIELSON, USAF, took off as Section Leader of a four plane flight, to participate in division tactics exercises. At approximately 0850U, the flight engaged an element of two F-86's in simulated serial combat, under the direction of Sun Bonnet Control. About ten minutes later, LT. DANIELSON'S plane was seen in a steep, diving turn, following close behind an F-86. At this point, the flight leader called for rendezvous. When LT DANIELSON failed to rendezvous, a radio and visual search was instigated, with negative results. At approximately 0905U, the plane was seen by ground observers. Statements of witnesses indicate that the plane pulled sharply out of a steep dive, traveled for a distance of about three miles at an extremely low altitude and high speed in a nearly level-flight attitude before crashing into a hillside.

The pilot's body, still in the ejection seat, was found two and one half miles from the point of impact. The pilot's helmet and canopy were found further back along the track of the aircraft. (See Diagram, Encl. 3)

30. Damage to Aircraft

The aircraft struck the side of a hill in a 20° (rough estimate) nose down attitude, at an angle of 50° (rough estimate) to the surface of the hill. The aircraft was completely demolished on impact. The wreckage was strewn over an area approximately one mile long by one half mile wide ahead of the point of impact.

31. The Investigation

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A. The Aircraft

1. At no point in the investigation was any indication of material failure or structural failure discovered.

2. Review of past history of the aircraft uncovered no pertinent discrepancies.

3. An attempt was made to determine the position of wing locking pins, elevator trim tabs and dive brakes, with the following results: Both dive brake cylinders were found, with the pistons retracted. A three foot section of the port inboard flap was found with the after dive brake retracted - no indications of the brake having been forced to the flush position by the impact. NOTE: Although the dive brakes appear to have been retracted prior to the impact, this does not preclude their having been used to help with the dive recovery.

Only one elevator trim tab was found, and its condition was such as to preclude determination of its position prior to impact. The wing locking pins were definitely in the locked position.

B. Ejection Seat and Pilot

1. The ejection seat was found in a muddy, plowed field, and appeared to have had no "ground travel" after the initial impact. The seat struck on the right side, the head rest striking first.

2. The pilot was still in the seat; death was primarily caused by

(b) (6)

3. The seat belt was unfastened - probably by impact, but possibly by the pilot immediately prior to impact.

4. The seat drogue chute was streamed.

5. The pilot's parachute ripcord had not been pulled.

6. The protective helmet and oxygen mask were missing. The helmet was later found about one mile from the seat, back along the flight path of the plane (see diagram, Encl. 3). The helmet was the one-piece type, and when found had the lining on one side torn out. The condition and location of the helmet indicates that the pilot may have had to remove his helmet prior to completing the ejection procedure.

7. The oxygen mask quick-disconnect fitting and retaining strap were found with the pilot's body.

C. Witnesses

All of the witnesses interviewed did not submit statements. A statistical summary of witnesses' comments is presented below.

1. Three witnesses at Parks AFB saw a jet plane in a steep dive from a distance of about six miles.

2. Five witnesses saw the plane after the pilot ejected. Three of these, who were interviewed, were questioned closely concerning the attitude of the plane. None of these three noticed anything unusual in the attitude. All three stated that the plane was "very low".

Two of the five (statements Encl. 1G and 1I) stated that the plane was inverted when they first saw it.

3. Two witnesses (statements not available) stated that they FIRST heard the sound of a plane from inside their houses and described the sound as a "thunder clap". They then ran outside, looked for the plane, and saw it directly overhead. The homes of both of these witnesses were directly below the flight path of the plane as determined by the positions of the aircraft, seat, and canopy. The distances of the homes from the point of impact were one half mile and one mile.

D. Proficiency of Pilot

LT DANIELSON was considered exceptionally well qualified to perform the type of maneuvers involved in this flight.

1. The pilot had flown several division tactics flights during which the division leader had deliberately flown the division at speeds equal to the limiting mach of the airplane.

2. The pilot had completed the division tactics stage of the squadron flight syllabus.

3. The V-n diagram for the F9F-5 was the subject of a safety lecture a week prior to the flight.

E. Weather

The exact state of the weather at the scene of the crash was impossible to determine. However, statements of witnesses indicate the following:

Cloud cover - overcast with breaks; extent or size of breaks unknown. Top of the overcast about 8,000 ft. Bottom of all clouds at least 2,000 ft. (all witnesses interviewed near scene of crash agree that the tops of all nearby hills were visible).

Visibility - Good beneath the overcast.

See Weather Report, Encl. #4.

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32. The Analysis

In view of the meager amount of information on this accident, the possibility of material failure should not be overlooked. However, since no evidence whatsoever can be found to indicate material failure, a hypothesis of pilot error is assumed and the accident will be discussed on the basis of that assumption.

Two separate situations are involved; and each will be discussed separately.

A. The pilot continued in his dive to an altitude which was too low to effect safe recovery.

There are two factors which could conceivably have caused or contributed to this.

1. Compressibility effects severe enough to cause "tucking under" and stick forces heavy enough to prevent the pilot's recovering until a low altitude was reached. However, as far as is known, use of dive brakes will invariably allow recovery at safe altitudes.

2. It is possible that the pilot followed the F-86 to an altitude from which the F-86 could effect a safe recovery; but the F9F-5 could not. Two witnesses, separately interviewed, described the phenomenon of hearing the "thunder clap" of a plane passing, then proceeding out of their homes, looking for the plane, and seeing it directly overhead. This is not possible unless: (a) two aircraft pass overhead at low altitude, the first at very high speed, or (b) the first aircraft recovers from a mach 1.0 dive at a higher altitude, and the coincidence of distances is such that the sound reaches the ground about four seconds ahead of the second aircraft. In this case, LT DANIELSON'S plane would have had to travel at nearly the speed of sound. This is considered unlikely.

3. Fogging of the canopy, together with failure of the pilot to orient himself quickly enough could have delayed recovery until an unsafe altitude was reached.

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Several instances of very rapid canopy fogging have been encountered in this squadron.

B. The second situation to be resolved is that of the pilot's ejection. Barring the possibility of material failure, it appears that if the pilot had not ejected, the aircraft could have been completely recovered to normal flight. However, the pilot elected to eject, apparently at a low altitude and very high speed. It is probable that the pilot would not have carried out the ejection unless he did not have visual reference with the ground.

Possible reasons for this are:

1. Fogged canopy
2. Black out or grey out
3. Weather (clouds)
4. Vertigo

C. Due to lack of direct evidence it is impossible to reach a definite conclusion as to the exact nature of the accident; however, the board offers the following possible reconstruction.

The pilot carried his run on the F-86 to an altitude too low to prevent complete recovery prior to entering the overcast. Recovery was initiated but not complete when the aircraft entered the overcast. The pilot, knowing he was in the vicinity of mountains, decided to eject when he found himself on instruments. On jettisoning his canopy, the one piece type helmet was caught by the air stream delaying the ejection. The ejection was completed at an altitude probably below 1,000 feet above the terrain and at an airspeed of over 500 knots indicated. At this time the aircraft was fully recovered to a normal flight attitude.

D. The safety equipment used was decidedly not effective in this case.

1. The ejection seat was effective in getting the pilot out of the aircraft, but the pilot was unable to get free of the seat.
2. The one-piece type helmet used was probably torn off during the ejection procedure, causing injury to the pilot's face.
3. The pilot was unable to use the parachute. It is believed that at the low altitude and high speed at which the pilot apparently ejected that the safety equipment, as now configured, could not have been expected to save the pilot.

33. Conclusions and Recommendations

The board adjudges pilot error as the most probable primary cause of the accident; however, it is definitely felt that one or more secondary causes must have been present. The board believes that the pilot's training in division tactics was adequate in all respects and further that training in the type of tactics employed on this flight is of utmost importance to pilots of Naval fighter squadrons.

In making the following recommendations concerning safety equipment, the board recognizes the fact that research is being continually conducted in an attempt to make this equipment more effective.

It is recommended that:

1. Navy type two-piece helmet, or Air Force P-1 type helmet be mandatory for pilots of jet aircraft.
2. A device be designed and installed to automatically release the safety belt immediately after ejection. A sketch of such a device is attached as Encl. 5.
3. Parachutes be designed to withstand opening at high speeds, and, if possible, be designed to open automatically at low altitudes.
4. The "ejection capsule" be incorporated in new construction aircraft at the earliest possible date.

13-110

ORIGINAL

DRAWING OF AREA OF SCENE OF CRASH

L.T. DIABLO
Elev. 3849'

N. (True)

Elev. 1960'

FLIGHT OF PLANE

CANOPY

HELMET

WITNESS

(b) (6)
ENCL 1-H

WITNESS

(b) (6)
ENCL 1-G

SEAT & BODY

PLANE

134111

Elev. 920'

CAMP PARKS

0 1 2 3 4 5
SCALE OF MILES

3 3

LIVERMORE

RESTRICTED
SECURITY INFORMATION

Copy of Aerological Officer, NAS Moffett Field, weather report for
10 December 1952.

NAL4-95-hd

11 December 1952

From: Aerological Officer, Naval Air Station, Moffett Field
To: Safety Officer, VF-713

Subj: Weather Observations for Livermore area at 0900 PST 10 Dec.
1952.

1. In response to your request, the following airways weather
reports are furnished. These are the closest weather reports to
Livermore available in this office.

Moffett Field 0900 PST 12,000 Sctd 25,000 broken, visibility
2 miles in haze, surface wind NW 2.

Stockton 0900 PST 25,000 Overcast, visibility 3 miles in
haze and smoke, surface wind ESE 4.

Oakland 0900 PST 25,000 thin broken, visibility 1 mile
in haze and smoke, surface wind calm.

(b) (6)

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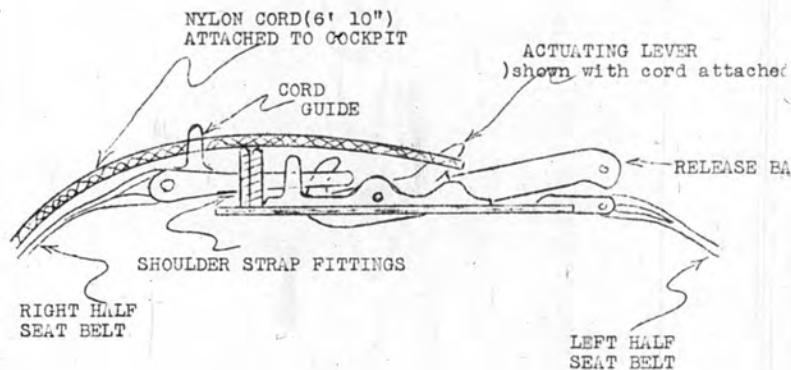
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ENCL (4) 34

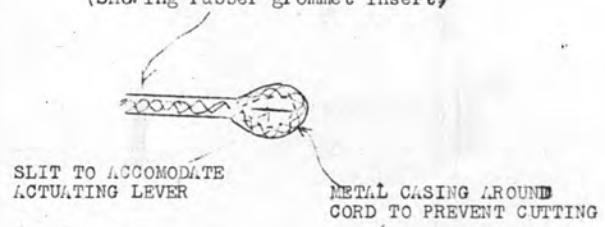
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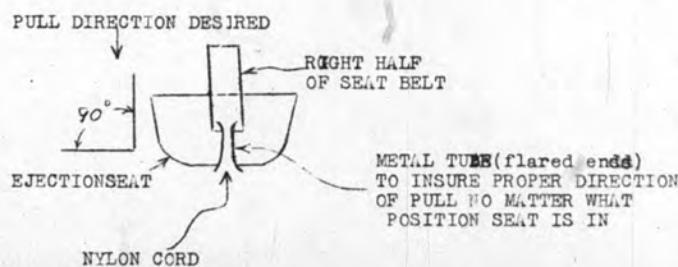
DIAGRAM OF MECHANISM TO AUTOMATICALLY RELEASE PILOT'S SEAT BELT
AFTER EJECTION.



TOP VIEW OF CORD BOOP
(Showing rubber grommet insert)

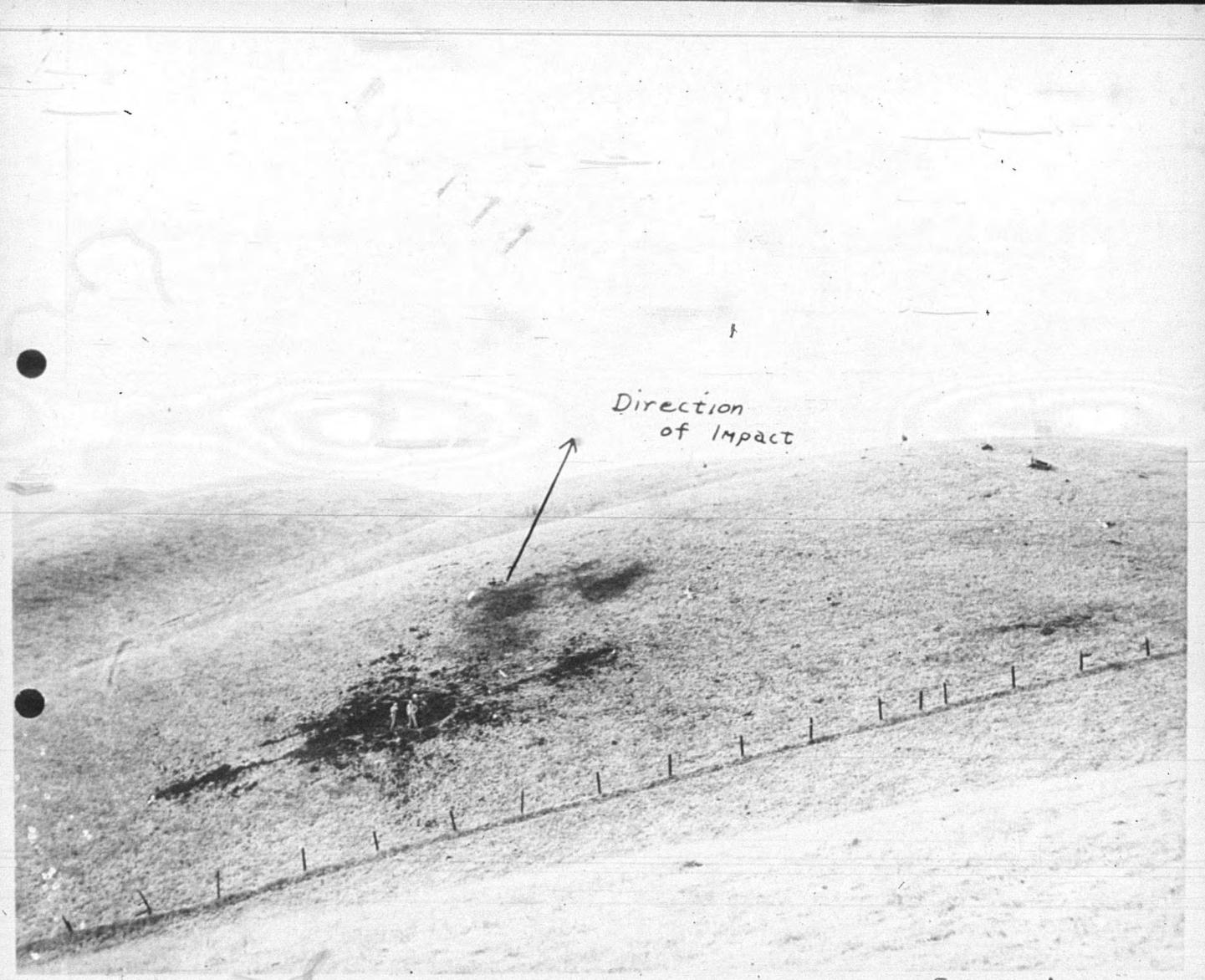


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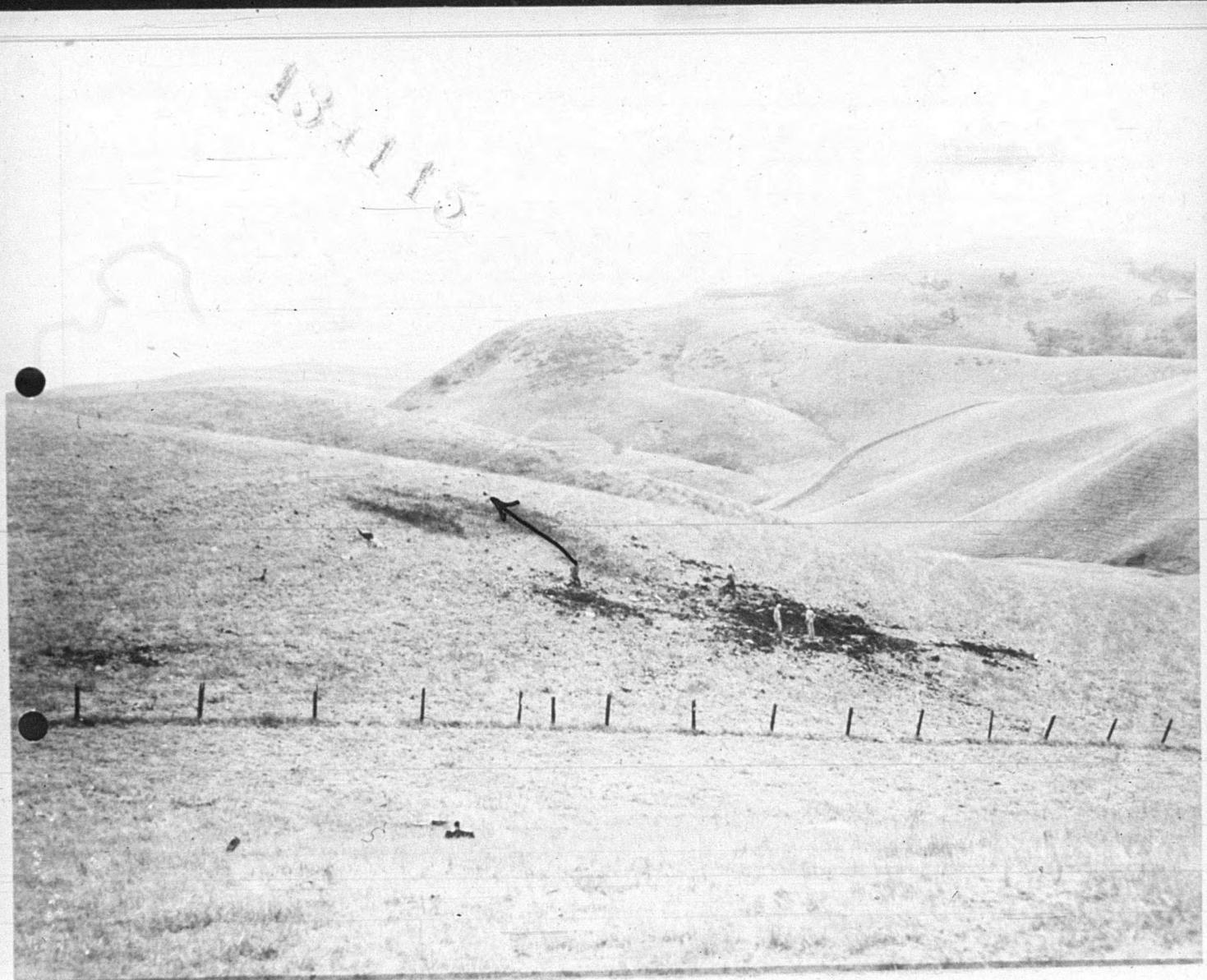
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Enclosure (5)



Direction
of Impact

Enc 2 A





Enc 2 c